

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 10 OCT 2001

WIPO PCT

14

Applicant's or agent's file reference 8H11PCA	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/FI00/00497	International filing date (day/month/year) 02.06.2000	Priority date (day/month/year) 03.06.1999	
International Patent Classification (IPC) or national classification and IPC ₇ B01D 19/00, B04B 1/00, D21D 5/26, F04D 7/04			
Applicant POM Technology Oy et al			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 03.01.2001	Date of completion of this report 03.10.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Lena Nilsson / MRo Telephone No. 08-782 25 00

Form PCT/IPEA/409 (cover sheet) (January 1998)

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00497

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement) under article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

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International application No.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-19</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-19</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-19</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

This International Preliminary Examination report replaces the report issued on 10 September 2001.

The claimed invention concerns a degassing centrifugal apparatus and especially the construction of the shovel wheel in the inlet end of the centrifuge. The special design of the shovels changes the direction of the incoming fluid so that it is deflected from its axial path and is directed radially towards the peripheral wall of the rotor. As a result of the shape of the shovels, the fluid will rotate at a speed, which is faster than the rotational speed of the rotating wall itself.

A rapid axial flow in an open channel of the kind provided by the hollow rotor of the claimed invention, having a gas column in the center of the rotor, is subjected to a phenomenon called the "hydraulic jump". The "hydraulic jump", which causes turbulence and consumes energy, has been found by the present inventor to be a problem in degassing apparatuses with an open liquid surface and a fast liquid flow.

WO, A1, 9323135 discloses a degassing pump with a stationary shell and a rotating blade wheel which scrapes the fluid along the stationary wall. The energy consumption of the pump proved large and there was a risk of turbulence at the liquid/gas boundary.

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Supplemental B x
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

US, A, 5861052 discloses a centrifugal apparatus similar the one described in the present invention. However, at the inlet end there is a blade wheel which only provides the incoming fluid with a rotation equal to that of the blade wheel and hence a peripheral velocity equal to that of the rotating wall. There is no indication of accelerating the fluid to a rotational speed exceeding that of the rotating wall. There is no discussion in US, A, 5861052 of a hydraulic jump nor any measures taken in the document to prevent the hydraulic jump from appearing.

None of WO, A1, 9323135 or US, A, 5861052 mentions the problem of a hydraulic jump or suggests any solution to the problem.

WO, A1, 9619276 discusses the hydraulic jump and means for reducing the problem is given. The solution to the problem is a transition ring or constriction in the rotating wall to make sure that the hydraulic jump occurs at a certain, well-defined position and in a controlled manner, which causes a minimum of disturbance in the degassing.

None of the cited documents reveals a degassing centrifugal apparatus, a process for degassing a fluid or a process for producing paper or board in a paper machine featuring all the characteristics claimed in claims 1, 14 or 19 respectively. Therefore, the subject-matter of claims 1, 14 and 19 is considered to be novel.

Furthermore, it does not seem obvious to a person skilled in the art to design a degassing centrifugal apparatus, a process for degassing a fluid or a process for producing paper or board in a paper machine according to claims 1, 14 and 19 respectively considering what is previously known from the cited documents. Consequently, the subject-matter of claims 1, 14 and 19 fulfils the requirements of inventive step.

Moreover, there is no reason to doubt the industrial applicability of the claimed invention according to claims 1, 14 and 19.

Finally, the dependent claims 2-13, 15-18 reveal further features of the claimed invention according to claims 1 and 14.

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